Chapter 4. Climate

In the Upper Gunnison Basin, precipitation ranges from less than 10 in/yr (9.3 in = 236 mm) at Powderhorn to more than 50 in/yr on the high points of the Elk Mountains north of Crested Butte, and around Uncompahgre Peak and Wetterhorn northwest of Lake City (Fig. 4-2, Table 4-1, Table 4-2). Crested Butte has the highest precipitation of any permanent station in the UGB, 25.1 in/yr (638 mm/yr), although for six years in the 1940s and 1950s a temporary station on Marshall Pass recorded an average of 25.5 in/yr (647 mm/yr). The weather station that was at Marshall Pass is the only one that was in the Basin in the Subalpine Zone, and there are none in the Alpine Zone. Our estimates of Subalpine and Alpine climates is based on extrapolation from areas outside the basin.

A significant feature of the climate of the UGB is *rainshadows*, especially prominent in the southern part of the Basin (Fig. 4-1). South of a line between West Elk Peak and Whitepine, there are major rainshadows in the valleys of Cebolla Creek (Powderhorn), middle Tomichi Creek (Parlin, Sargents) and in upper Cochetopa Creek (Cochetopa and Saguache Parks). Notice how much more stratified the isoclines are in the southern half of the basin (Fig. 4-2).

Most of the precipitation in the southern part of the UGB comes from the west. At high elevations, the high ridge extending north from the San Juan Mountains, and the West Elk Mountains, form two side of a gate. These tall portals are able to stop much precipitation from entering the Basin. In between the portals of this gate, there are two north-south ridges forming precipitation barriers for lower elevations: Cerro Summit (2,700 m = 8,900 ft) and Arrowhead (Cimarron) Summit (2,650 m = 8,704 ft).

Average annual temperature at weather stations in the Upper Gunnison Basin ranges from just above freezing at Taylor Park, 32.5°F (0.3°C), to 40.2°F (4.7°C) at Blue Mesa Lake, in the bottom of the Basin at its western end. Taylor Park is in a large cold air mass most of the year. Actually, Powderhorn is "warm" only in comparison with the rest of the basin; this is a strong indicator of the fact that the UGB is a cold basin.

The climate of the sagebrush stands in the large park forming the bottom of the Upper Gunnison Basin is closely related to the climate of the Colorado Plateau (Comstock and Ehleringer 1992).

Table 4-1. Weather stations used in this analysis, sorted by annual precipitation.

Station	No. Years Record	Elevation, ft	Annual Precip., in	Annual Temp., °F	January Temp., °F	July Temp., °F	Annual Snowfall, in
Saguache*	104	7,700	8.33	42.6	19.4	64.1	23.6
Powderhorn	8	8,090	9.30	36.2	12.4	58.6	39.2
Buena Vista*	67	7,890	9.42	43.8	25.1	64.1	33.6
Blue Mesa	32	7,620	9.71	40.2	13.6	63.9	57.1
Gunnison	110	7,630	9.87	37.5	9.1	61.5	48.5
Sargents 6W†	12	8,130	10.44				76.6
Salida*	101	7,050	10.85	45.8	27.6	65.7	48.1
Sapinero 8E	47	7,800	11.11	38.9	18.2	59.4	87.3
Cochetopa Creek	51	8,000	11.13	37.5	10.7	61.2	50.1
Cimarron*	47	7,240	12.68	41.1	16.7	64.2	54.8
Sargents†	40	8,470	13.57				96.1
Lake City	93	8,890	14.00	38.6	15.6	60.3	84.9
Pitkin	56	9,200	16.25	33.3	11.9	54.9	88.0
Taylor Park	58	9,210	16.31	32.5	7.4	55.8	80.4
Rio Grande Reservoir*	21	9,500	19.50	34.1	13.2	55.6	95.1
Sapinero 9W	27	9,300	22.54	39.0	19.4	59.3	209.1
Crested Butte	104	8,870	24.52	34.6	12.1	56.9	187.3
Marshall Pass†	6	10,850	25.47				277.5

*. Weather station outside the Upper Gunnison Basin, used for comparison.

†. No temperature records taken.

Table 4-2. Weather stations used in this analysis, sorted by annual temperature.							
Station	No. Years Record	Elevation, m	Annual Precip., mm	Annual Temp., °C	January Temp., °C	July Temp., °C	Annual Snowfall, cm
Marshall Pass†	6	3,307	646.9				704.9
Taylor Park	58	2,807	414.3	0.3	-13.7	13.2	204.2
Pitkin	56	2,804	412.8	0.7	-11.2	12.7	223.5
Rio Grande Reservoir*	21	2,895	495.3	1.2	-10.4	13.1	241.6
Crested Butte	104	2,703	622.8	1.4	-11.1	13.8	475.7
Powderhorn	8	2,466	236.2	2.3	-10.9	14.8	99.6
Cochetopa Creek	51	2,438	282.7	3.1	-11.8	16.2	127.3
Sargents 6W†	12	2,478	265.2				194.6
Sargents†	40	2,582	344.7				244.1
Gunnison	110	2,326	250.7	3.1	-12.7	16.4	123.2
Lake City	93	2,710	355.6	3.7	-9.1	15.7	215.6
Sapinero 8E	47	2,377	282.2	3.8	-7.7	15.2	221.7
Sapinero 9W	27	2,835	572.5	3.9	-7.0	15.2	531.1
Blue Mesa	32	2,322	246.6	4.6	-10.2	17.7	145.0
Cimarron*	47	2,207	322.1	5.1	-8.5	17.9	139.2
Saguache*	104	2,347	211.6	5.9	-7.0	17.8	59.9
Buena Vista*	67	2,405	239.3	6.6	-3.8	17.8	85.3
Salida*	101	2,149	275.6	7.7	-2.4	18.7	122.2

*. Weather station outside the Upper Gunnison Basin, used for comparison.
†. No temperature records taken; position in table is approximate.

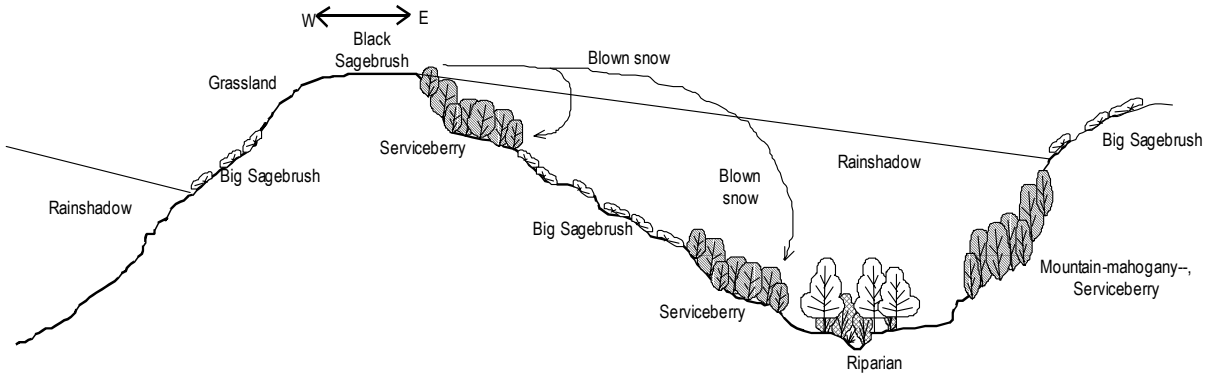


Fig. 4-1. "Lesser rainshadows" caused by the mesas and high ridges. These mesas and high ridges run north-south, and protect part of the leeward valley from wind in the winter and early spring. The plant communities shown are *potential* plant communities. Higher up in the same watershed, the serviceberry community just to the east of the ridge could be replaced by islands of Douglas-fir or aspen, usually with serviceberry understories.

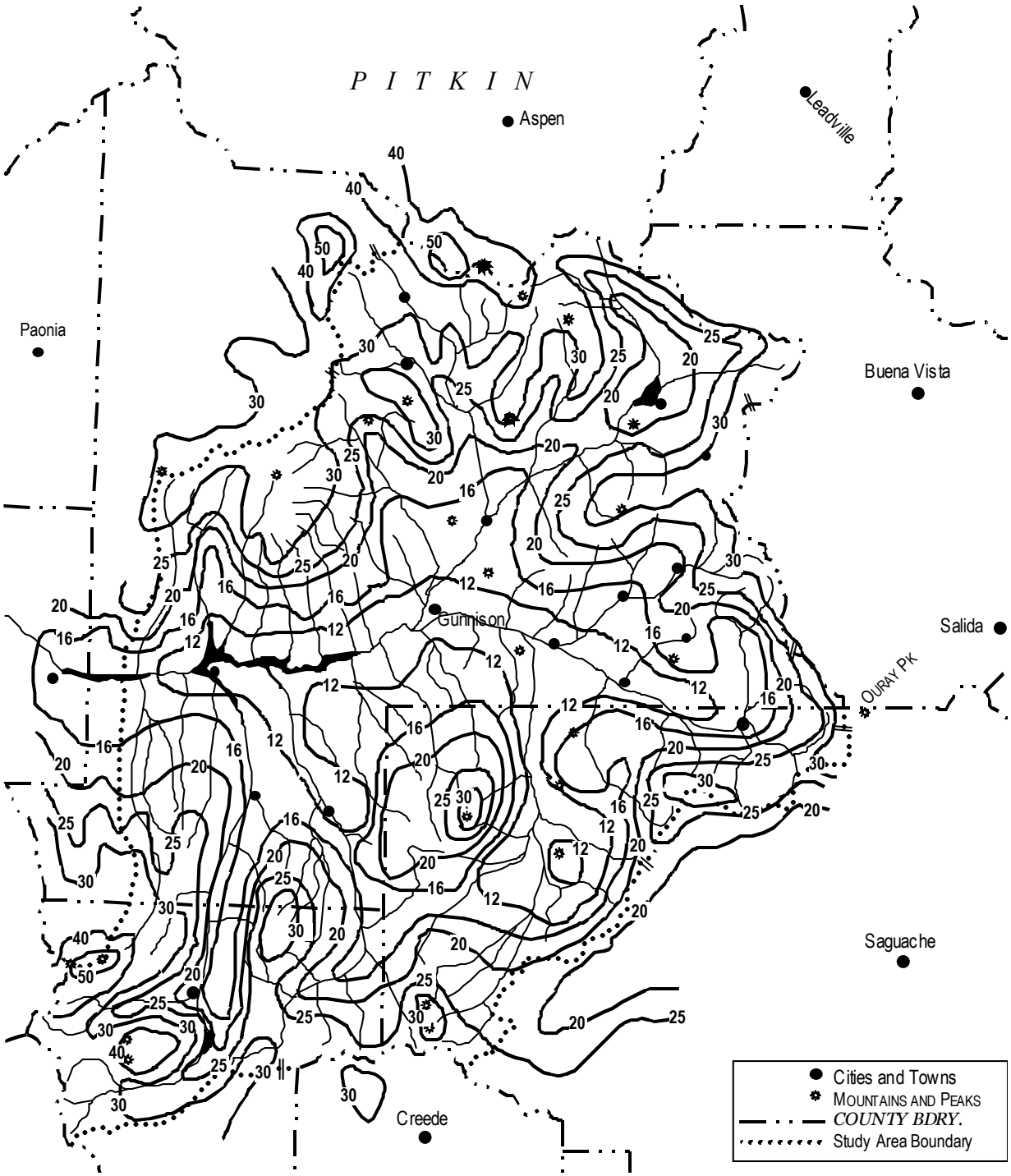


Fig 4-2. Average annual precipitation in the Upper Gunnison Basin. Solid lines are isoclines, labeled in average in/yr (compiled from U.S. Geological Survey 1992 and Colorado Climate Center 1998).

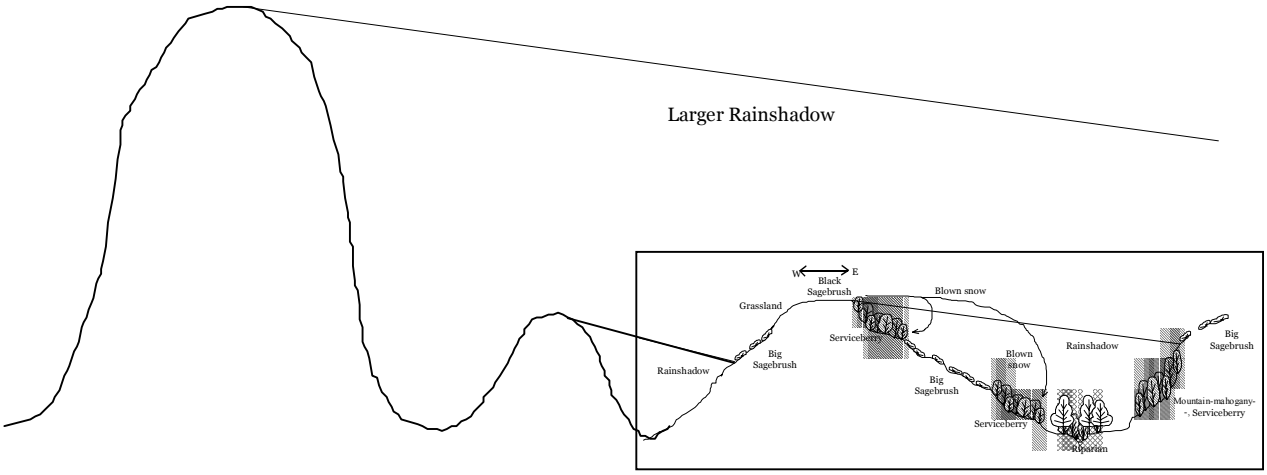


Fig. 4-3. The "larger rainshadow" caused by the high mountains to the west of the Upper Gunnison Basin. The "lesser rainshadow" from Fig. 4-1 (dotted box) is included. The result is that the grassland and sagebrush shrublands shown in this figure are within the larger rainshadow, so they have characteristic rainshadow species such as Arizona fescue and Parry oatgrass.

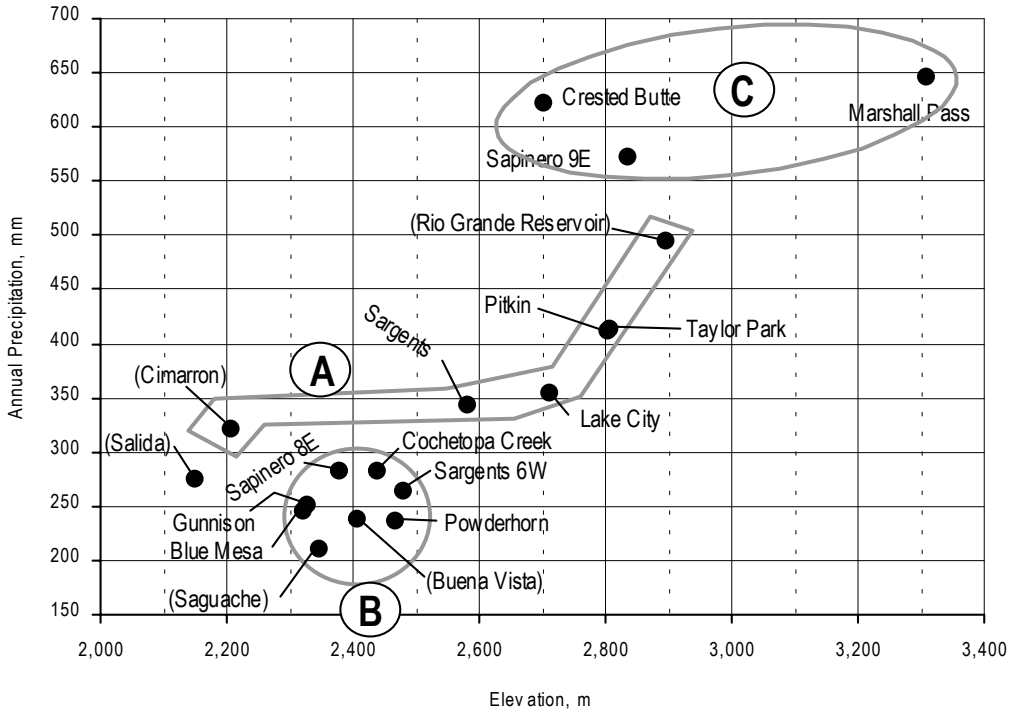


Fig. 4-4. Precipitation versus elevation in the Gunnison Basin. Group A – Partial rainshadow. Group B – Deep rainshadow. Group C – Outside rainshadow. Stations outside the Upper Gunnison Basin are shown (in parenthesis).

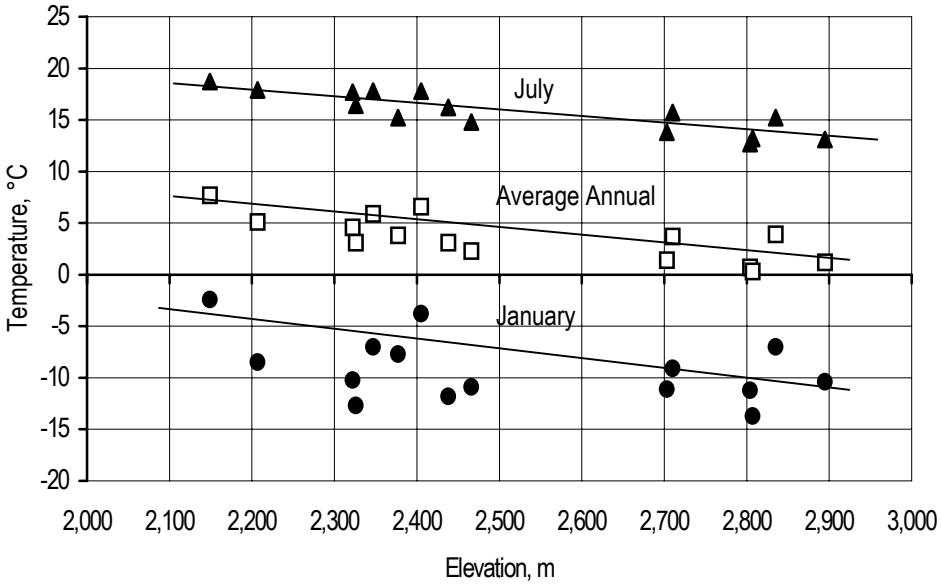


Fig. 4-5. Monthly temperature versus elevation in the Gunnison Basin.

Looking south down a ridge just west of Beaver Creek; Blue Mesa Reservoir is visible in the left middleground, and the high peaks around Lake City on the horizon. Normal wind direction is from west to east, that is from right to left across the picture. In the winter, the wind deposits the snow in the lee on the left, leading to deeper soils, more tall shrubs, and moister conditions even in late season. On the windward (right) side of the photo, dry windswept grassland with black sagebrush below. On the leeward (left) side of the photo, serviceberry shrubland. September 12, 1995.

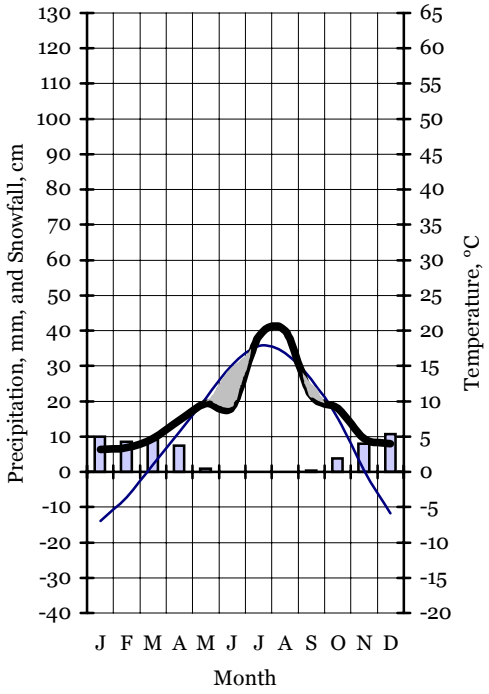
Saguache — 104 yr (1894-1997) — 7,700 ft (2,347 m)

Quantity	Min	Avg	Max
Yearly Temp. °F	17.7	42.6	67.3
January Temp. °F	-10.2	19.4	47.9
July Temp. °F	38.6	64.1	88.5
Absolute Temp. °F	-34		98
Yearly Precip. in	0.1	8.3	16.2
January Precip. in	0.0	0.3	1.0
July Precip. in	0.0	1.5	4.2
Yearly Snowfall, in	0.0	23.6	55.2

Averages

	Jan	Feb	Mar	Apr	May	Jun
T, °C	-7.0	-3.6	1.0	5.7	10.4	15.1
P, mm	6.4	6.9	9.4	14.7	19.3	18.3
S, cm	9.9	8.6	9.1	7.4	1.0	0.0

	Jul	Aug	Sep	Oct	Nov	Dec	Ann
T, °C	17.8	16.8	13.1	7.5	0.2	-5.9	5.89
P, mm	38.4	40.1	21.8	18.0	9.4	7.9	211.58
S, cm	0.0	0.0	0.3	3.8	7.9	10.7	59.94



The weather station at Saguache is not actually in the Gunnison Basin, but in the northern San Luis Valley to the southeast of the UGB. It is included here because it occurs farther east yet than the rainshadows in the southern UGB. So, it illustrates the most extreme rainshadow in this region of Colorado, with very low annual precipitation and droughts in both early and late summer. This weather station is warmer than any in the UGB.

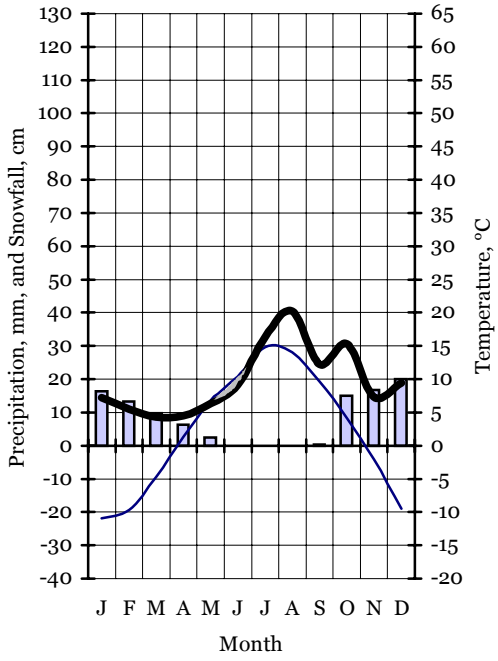
Powderhorn — 8 yr (1964-1971) — 8,090 ft (2,466 m)

Quantity	Min	Avg	Max
Yearly Temp. °F	14.6	36.2	58.4
January Temp. °F	-15.5	12.4	37.8
July Temp. °F	36.1	58.6	82.8
Absolute Temp. °F	-46		90
Yearly Precip. in	0.3	9.3	17.2
January Precip. in	0.0	0.6	1.5
July Precip. in	0.0	1.3	2.7
Yearly Snowfall, in	0.5	39.2	86.0

Averages

	Jan	Feb	Mar	Apr	May	Jun
T, °C	-10.9	-9.7	-4.8	1.3	6.8	10.4
P, mm	14.5	10.9	8.6	9.1	12.7	18.3
S, cm	16.3	13.2	9.7	6.4	2.5	0.0

	Jul	Aug	Sep	Oct	Nov	Dec	Ann
T, °C	14.8	14.1	9.6	4.1	-2.1	-9.5	2.33
P, mm	32.8	40.4	24.4	30.7	14.7	18.8	236.22
S, cm	0.0	0.0	0.3	15.0	16.8	20.1	99.57



Climate records were taken at the weather station at Powderhorn for only 8 yr in the 1960s and 1970s, yet it illustrates well the climate under a moderately severe rainshadow. There is only one drought period, early May through late June.

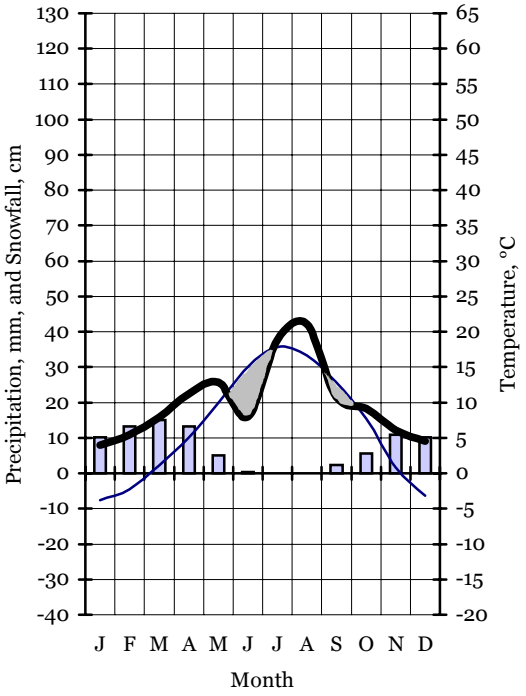
Buena Vista — 67 yr (1931-1997) — 7,980 ft (2,432 m)

Quantity	Min	Avg	Max
Yearly Temp. °F	25.1	43.8	64.0
January Temp. °F	-1.8	25.1	50.1
July Temp. °F	43.4	64.1	88.5
Absolute Temp. °F	-32		97
Yearly Precip. in	1.1	9.4	16.3
January Precip. in	0.0	0.3	2.0
July Precip. in	0.0	1.5	5.7
Yearly Snowfall, in	0.0	33.6	99.0

Averages

	Jan	Feb	Mar	Apr	May	Jun
T, °C	-3.8	-2.3	1.1	5.1	10.0	15.0
P, mm	7.9	10.9	15.7	22.4	25.7	16.0
S, cm	10.2	13.2	15.0	13.2	5.1	0.3

	Jul	Aug	Sep	Oct	Nov	Dec	Ann
T, °C	17.8	16.7	12.9	7.7	0.8	-3.2	6.56
P, mm	37.6	42.2	21.6	18.3	12.2	9.1	239.27
S, cm	0.0	0.0	2.3	5.6	10.9	10.2	85.34



Buena Vista lies well outside the UGB, and is generally warmer than anywhere in the UGB. Nonetheless, it illustrates well the deep rainshadow climate, since it lies in the deep Arkansas valley just east of the high peaks of the Sawatch Range. There are two drought periods, mid-May through mid-July, and early September through early October. Buena Vista is located in the Piñon-Juniper Zone, not present in the UGB.

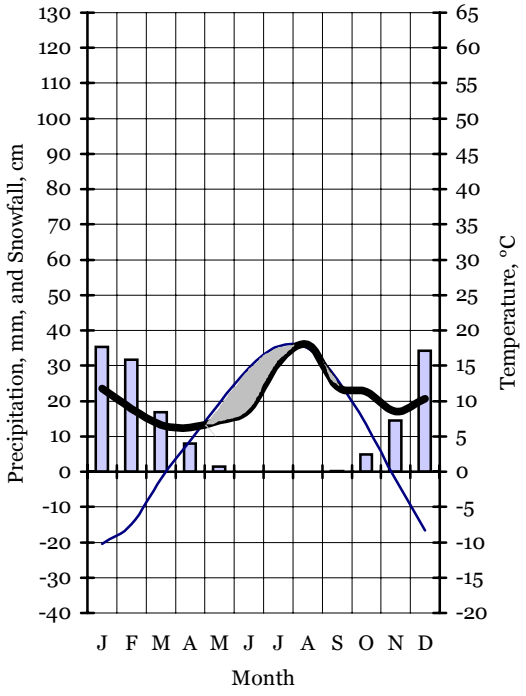
Blue Mesa Dam and Blue Mesa Lake — 32 yr (1966-1997) — 7,620 ft (2,322 m)

Quantity	Min	Avg	Max
Yearly Temp. °F	23.0	40.2	57.8
January Temp. °F	-8.2	13.6	34.0
July Temp. °F	42.1	63.9	85.0
Absolute Temp. °F	-36		95
Yearly Precip. in	1.4	9.7	19.1
January Precip. in	0.0	0.9	2.6
July Precip. in	0.0	1.2	3.3
Yearly Snowfall, in	16.5	57.1	103.7

Averages

	Jan	Feb	Mar	Apr	May	Jun
T, °C	-10.2	-7.4	-1.0	4.3	9.7	14.7
P, mm	22.9	17.8	12.7	12.7	15.2	17.8
S, cm	35.3	31.8	17.0	8.1	1.5	0.0

	Jul	Aug	Sep	Oct	Nov	Dec	Ann
T, °C	17.7	17.5	13.1	6.7	-1.1	-8.3	4.56
P, mm	30.5	35.6	22.9	22.9	17.8	20.3	246.63
S, cm	0.0	0.0	0.3	4.8	14.5	34.0	144.98



These data are combined from Blue Mesa Dam (1966-1967) and Blue Mesa Lake (1967-present). This weather station represents the arid bottom of the basin, close to the climates of the Foothills-Semidesert Shrub Zone. The present weather station is in Ecological Type SB1, Wyoming big sagebrush on Aridic soils.

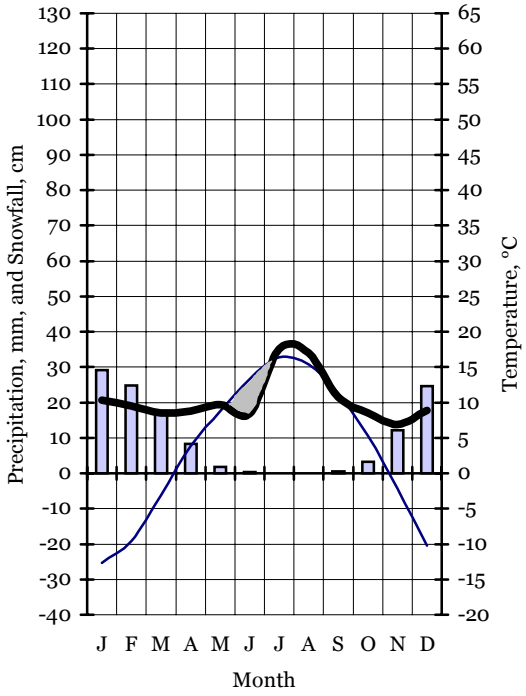
Gunnison — 110 yr (1888-1997) — 7,630 ft (2,326 m)

Quantity	Min	Avg	Max
Yearly Temp. °F	13.8	37.5	60.6
January Temp. °F	-22.2	9.1	40.4
July Temp. °F	37.3	61.5	85.8
Absolute Temp. °F	-47		96
Yearly Precip. in	1.2	9.9	17.7
January Precip. in	0.0	0.8	3.5
July Precip. in	0.0	1.4	4.2
Yearly Snowfall, in	7.0	48.5	97.5

Averages

	Jan	Feb	Mar	Apr	May	Jun
T, °C	-12.7	-9.6	-3.2	3.9	8.8	13.3
P, mm	20.6	19.1	17.0	17.5	19.3	16.8
S, cm	29.2	24.9	17.5	8.4	1.8	0.3

	Jul	Aug	Sep	Oct	Nov	Dec	Ann
T, °C	16.4	15.4	11.3	5.3	-2.2	-10.2	3.06
P, mm	35.1	34.0	21.6	17.0	13.7	17.8	250.70
S, cm	0.0	0.0	0.5	3.3	12.2	24.6	123.19



This is the oldest weather station in the UGB. It illustrates well the partial rainshadow of the middle and east bottom of the basin, from just below Gunnison to just below Sargents. It shows drought from mid-May through the first week in July, but the lines almost cross in mid-September. The September lines have been getting close together in the last five years, indicating that Gunnison is getting dryer or warmer then. The Gunnison weather station is located in Ecological Type FR1, Narrowleaf cottonwood on Fluvaquentic soils.

Sargents 6W — 12 yr (1947-1958) — 8,130 ft (2,478 m)

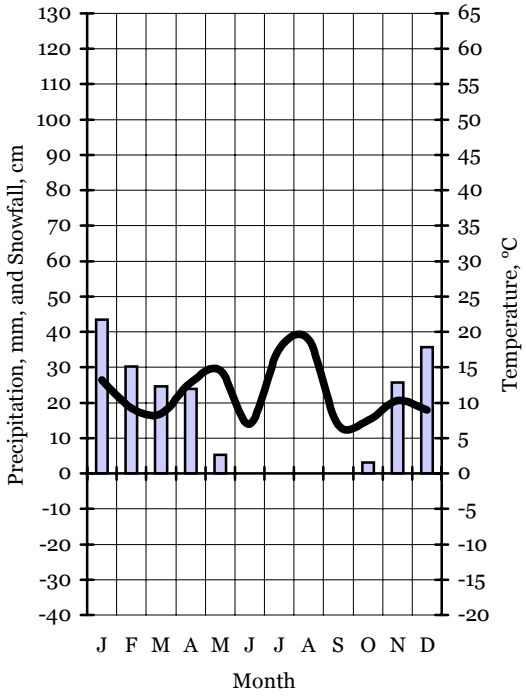
(Precipitation and Snowfall only)

Quantity	Min	Avg	Max
Yearly Precip. in	4.1	10.4	17.9
January Precip. in	0.0	1.0	2.4
July Precip. in	0.0	1.4	3.4
Yearly Snowfall, in	33.3	76.6	109.6

Averages

	Jan	Feb	Mar	Apr	May	Jun
P, mm	26.4	18.5	16.8	25.7	29.2	14.0
S, cm	43.4	30.2	24.6	23.9	5.3	0.0

	Jul	Aug	Sep	Oct	Nov	Dec	Ann
P, mm	35.1	37.8	13.7	15.0	20.6	18.0	265.18
S, cm	0.0	0.0	0.0	3.0	25.7	35.6	194.56



This weather station collected data for twelve years in the late 1940s and 1950s. I am not exactly sure where this weather station was – the cited location puts it near the confluence of Tomichi Creek and Needle Creek. Although temperature data were not taken here, I can imagine a drought period from around June 1 through the first week in July, and another drought period from around September 1 through mid-October. This would represent the lower end of the Mountain Shrub Zone.

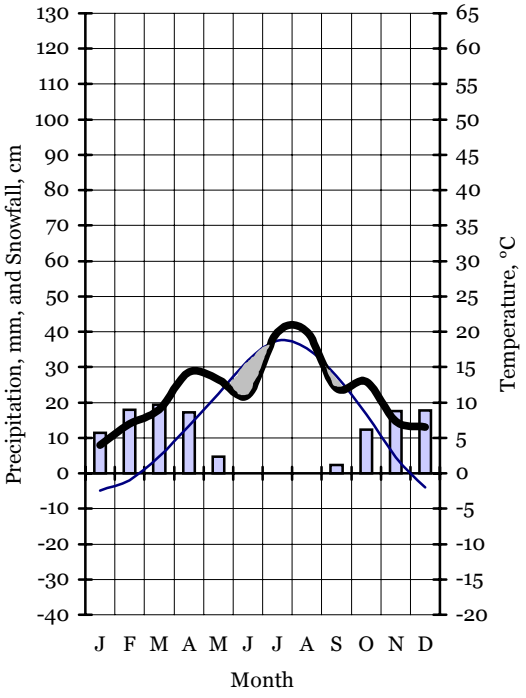
Salida	101 yr (1897-1997)	7,050 ft (2,149 m)

Quantity	Min	Avg	Max
Yearly Temp. °F	25.4	45.8	67.5
January Temp. °F	-0.5	27.6	50.9
July Temp. °F	42.8	65.7	90.0
Absolute Temp. °F	-35		100
Yearly Precip. in	3.1	10.9	17.9
January Precip. in	0.0	0.3	2.1
July Precip. in	0.0	1.6	3.8
Yearly Snowfall, in	11.7	48.1	131.0

Averages

	Jan	Feb	Mar	Apr	May	Jun
T, °C	-2.4	-1.0	2.4	6.7	11.2	15.9
P, mm	7.9	14.0	18.0	28.7	26.4	22.1
S, cm	11.4	18.0	19.3	17.3	4.8	0.0

	Jul	Aug	Sep	Oct	Nov	Dec	Ann
T, °C	18.7	17.7	13.8	8.3	2.3	-2.0	7.67
P, mm	39.9	40.1	24.1	25.9	14.7	13.0	275.59
S, cm	0.0	0.0	2.3	12.4	17.5	17.8	122.17



Salida lies well outside the UGB, and is generally warmer than anywhere in the UGB. Nonetheless, it illustrates well the deep rainshadow climate, since it lies in the deep Arkansas valley just east of the high peaks of the Sawatch Range. There are two drought periods, mid-May through early July, and early September through late September. Salida is located either in the Piñon-Juniper Zone, not present in the UGB, or in the Foothills-Semidesert Shrub Zone.

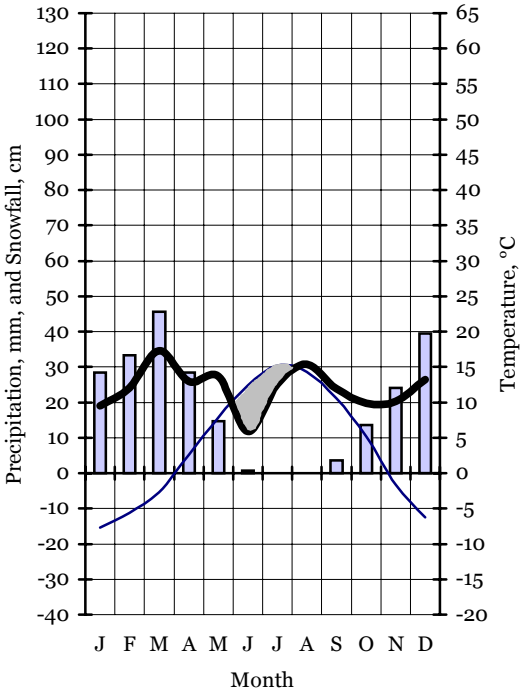
Sapinero 8E	47 yr (1919-1965)	7,800 ft (2,377 m)

Quantity	Min	Avg	Max
Yearly Temp. °F	23.9	38.9	55.0
January Temp. °F	-7.6	18.2	39.5
July Temp. °F	42.8	59.4	78.7
Absolute Temp. °F	-36		88
Yearly Precip. in	2.1	11.1	29.4
January Precip. in	0.0	0.8	3.7
July Precip. in	0.0	1.0	2.9
Yearly Snowfall, in	15.1	87.3	265.4

Averages

	Jan	Feb	Mar	Apr	May	Jun
T, °C	-7.7	-5.6	-2.7	2.6	7.9	12.4
P, mm	19.1	24.1	34.5	25.9	27.4	11.7
S, cm	28.4	33.3	45.7	28.4	14.7	0.8

	Jul	Aug	Sep	Oct	Nov	Dec	Ann
T, °C	15.2	14.3	10.6	5.2	-1.6	-6.2	3.83
P, mm	25.1	30.7	23.9	19.8	20.3	26.4	282.19
S, cm	0.0	0.0	3.6	13.5	24.1	39.4	221.74



This weather station was maintained for a long time, yet I am not sure where it was – given the dates, perhaps this station was moved to the new Blue Mesa Dam station when the dam was constructed, or maybe its location was covered by Blue Mesa Reservoir. It represents the severest rainshadow of any station in the basin, with one long drought from late May through mid-August.

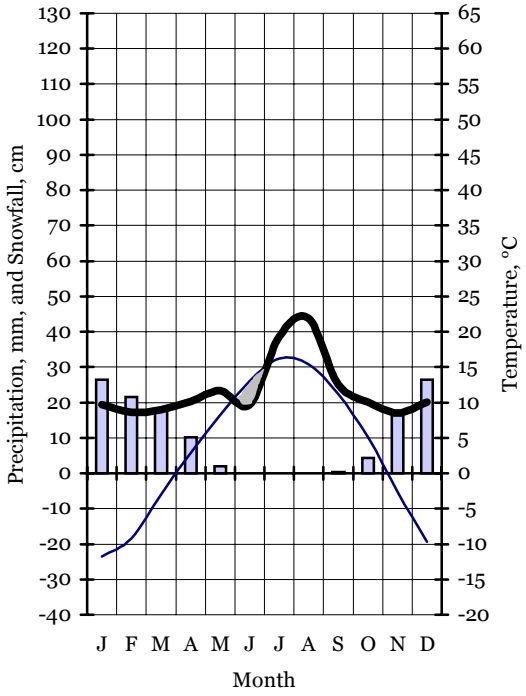
Cochetopa Creek — 51 yr (1947-1997) — 8,000 ft (2,438 m)

Quantity	Min	Avg	Max
Yearly Temp. °F	14.8	37.5	59.1
January Temp. °F	-19.6	10.7	41.1
July Temp. °F	38.3	61.2	84.4
Absolute Temp. °F	-40		93
Yearly Precip. in	3.9	11.1	17.8
January Precip. in	0.0	0.8	2.5
July Precip. in	0.0	1.5	3.8
Yearly Snowfall, in	22.0	50.1	107.0

Averages

	Jan	Feb	Mar	Apr	May	Jun
T, °C	-11.8	-9.2	-3.1	2.9	8.2	13.0
P, mm	19.3	17.3	18.0	20.3	23.4	19.3
S, cm	26.4	21.6	18.3	10.2	2.0	0.0

	Jul	Aug	Sep	Oct	Nov	Dec	Ann
T, °C	16.2	15.4	11.2	5.1	-2.6	-9.7	3.06
P, mm	38.6	43.9	25.1	20.1	17.0	20.1	282.70
S, cm	0.0	0.0	0.3	4.3	17.0	26.4	127.25



The Cochetopa Creek weather station is in lower Cochetopa Park, a large circular park with Cochetopa Dome in the middle – the remains of a large volcanic caldera. The present weather station is in Ecological Type SS4, Big sagebrush/Arizona fescue on Mollisols.

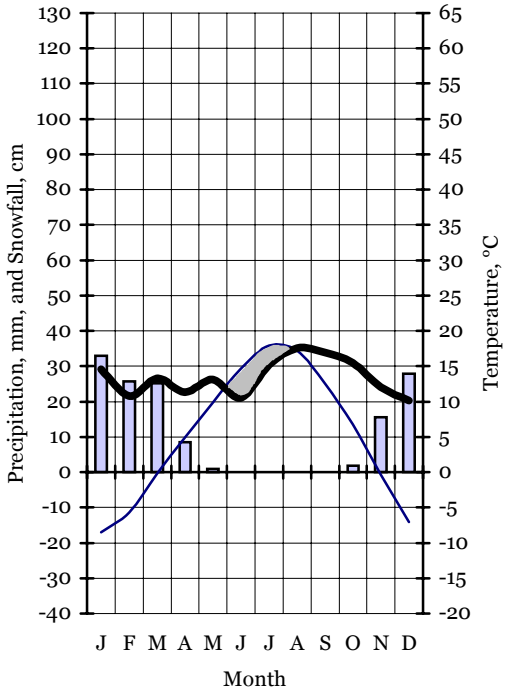
Cimarron — 47 yr (1951-1997) — 7,240 ft (2,207 m)

Quantity	Min	Avg	Max
Yearly Temp. °F	19.2	41.1	64.4
January Temp. °F	-10.3	16.7	42.3
July Temp. °F	38.1	64.2	90.1
Absolute Temp. °F	-43		98
Yearly Precip. in	4.8	12.7	30.1
January Precip. in	0.0	1.2	10.0
July Precip. in	0.0	1.2	3.5
Yearly Snowfall, in	0.0	54.8	120.0

Averages

	Jan	Feb	Mar	Apr	May	Jun
T, °C	-8.5	-5.7	-0.2	4.9	9.9	14.7
P, mm	29.2	21.6	26.7	22.6	26.2	21.1
S, cm	33.0	25.7	25.1	8.6	1.0	0.0

	Jul	Aug	Sep	Oct	Nov	Dec	Ann
T, °C	17.9	17.2	12.5	6.8	-0.4	-7.1	5.06
P, mm	30.5	35.1	33.8	31.0	24.1	20.3	322.07
S, cm	0.0	0.0	0.0	1.8	15.5	27.9	139.19



Cimarron is not actually in the Upper Gunnison Basin, but lies about ten miles west of it, in a narrow river valley between Cerro Summit and Arrowhead Summit. It illustrates the concept of a deep rainshadow, with drought from late May through early August.

Sargents — 40 yr (1958-1997) — 8,470 ft (2,582 m)

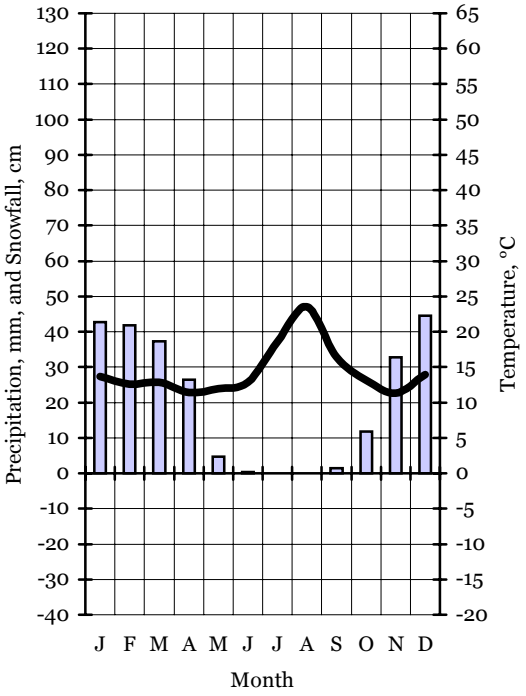
(Precipitation and Snowfall only)

Quantity	Min	Avg	Max
Yearly Precip. in	2.4	13.6	24.2
January Precip. in	0.0	1.1	6.3
July Precip. in	0.0	1.5	2.8
Yearly Snowfall, in	7.0	96.1	244.8

Averages

	Jan	Feb	Mar	Apr	May	Jun
P, mm	27.4	25.1	25.7	22.9	23.9	25.7
S, cm	42.7	41.9	37.3	26.4	4.8	0.3

	Jul	Aug	Sep	Oct	Nov	Dec	Ann
P, mm	37.1	47.0	33.0	26.2	22.6	27.9	344.68
S, cm	0.0	0.0	1.5	11.7	32.8	44.5	244.09



The weather station at Sargents lies at the east end of the valley in the bottom of Upper Gunnison Basin. The present weather station lies in the Montane Zone, in Ecological Type SS6, Bitterbrush-big sagebrush/Arizona fescue on Mollisols.

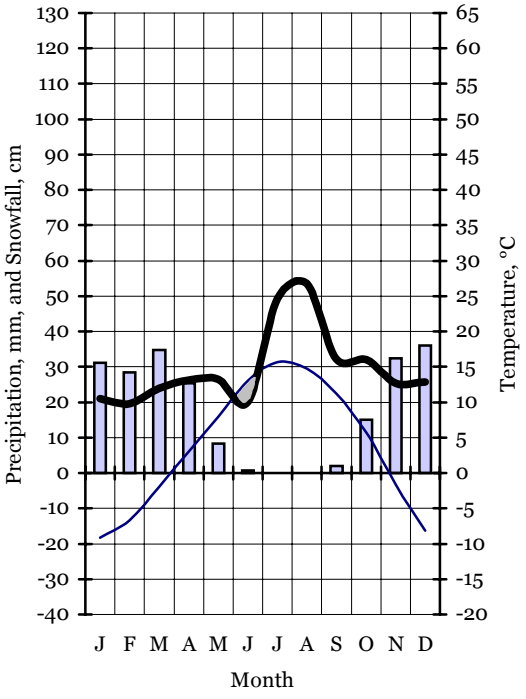
Lake City — 93 yr (1905-1997) — 8,890 ft (2,710 m)

Quantity	Min	Avg	Max
Yearly Temp. °F	16.4	38.6	58.7
January Temp. °F	-14.2	15.6	42.9
July Temp. °F	39.3	60.3	81.3
Absolute Temp. °F	-38		98
Yearly Precip. in	6.9	14.0	22.2
January Precip. in	0.0	0.8	3.3
July Precip. in	0.0	1.9	5.5
Yearly Snowfall, in	28.1	84.9	141.5

Averages

	Jan	Feb	Mar	Apr	May	Jun
T, °C	-9.1	-6.7	-2.0	3.1	8.0	13.0
P, mm	21.1	19.6	23.9	26.2	26.4	20.1
S, cm	31.2	28.4	34.8	25.4	8.4	0.8

	Jul	Aug	Sep	Oct	Nov	Dec	Ann
T, °C	15.7	14.8	11.2	5.7	-1.6	-8.1	3.67
P, mm	49.3	53.6	32.3	32.0	25.4	25.7	355.60
S, cm	0.0	0.0	2.0	15.0	32.5	36.1	215.65



The Lake City weather station shows the partial spring rainshadow climate with significant growing season precipitation. There is only one, short drought period, from late May through late June. The weather station is in the Montane Zone, in Ecological Type SS6, Bitterbrush-big sagebrush/Arizona fescue on Mollisols.

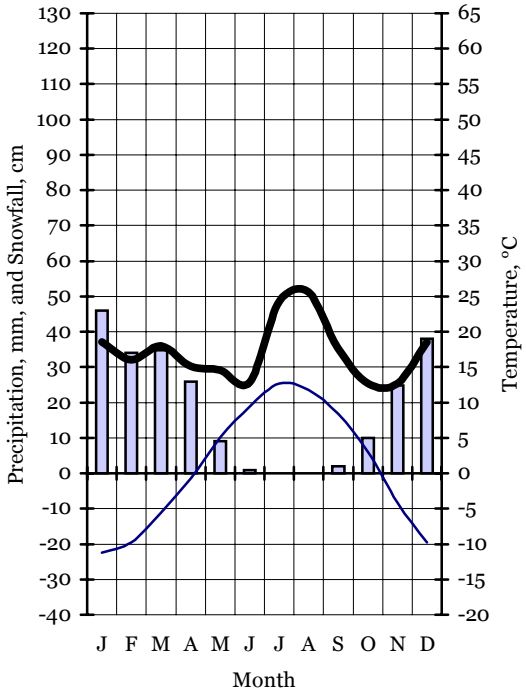
Pitkin	56 yr (1931-1986)	9,200 ft (2,804 m)

Quantity	Min	Avg	Max
Yearly Temp. °F	14.7	33.3	52.0
January Temp. °F	-11.4	11.9	35.7
July Temp. °F	34.5	54.9	78.0
Absolute Temp. °F	-38		86
Yearly Precip. in	6.6	16.3	26.7
January Precip. in	0.0	1.5	4.4
July Precip. in	0.0	1.9	4.6
Yearly Snowfall, in	57.0	88.0	203.0

Averages

	Jan	Feb	Mar	Apr	May	Jun
T, °C	-11.2	-9.8	-5.6	-0.7	5.1	9.4
P, mm	37.1	32.0	36.1	30.2	29.2	25.7
S, cm	46.0	34.0	34.8	25.9	9.1	1.0

	Jul	Aug	Sep	Oct	Nov	Dec	Ann
T, °C	12.7	11.8	8.4	3.0	-4.2	-9.8	0.72
P, mm	48.5	51.3	35.3	25.4	25.4	37.1	412.75
S, cm	0.0	0.0	2.0	9.9	24.9	38.1	223.52



The weather station at Pitkin was maintained for over half a century, yet was abandoned in 1986. The weather station is in a narrow forested valley. It illustrates the upper Montane forested climate well, with no drought periods and significant snowfall. The last location of the weather station was near the boundary between Ecological Type RI2, Blue willow/reedgrass-beaked sedge riparian, and Ecological Type FD09, Douglas-fir/pachistima with lodgepole pine the current dominant.

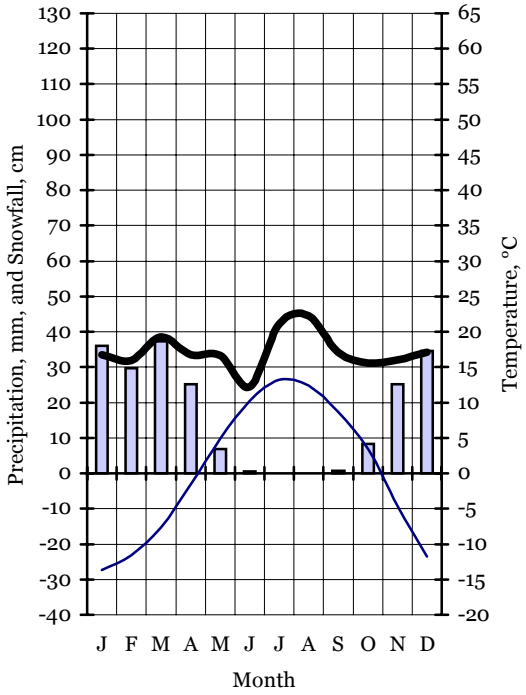
Taylor Park	58 yr (1940-1997)	9,210 ft (2,807 m)

Quantity	Min	Avg	Max
Yearly Temp. °F	6.7	32.5	51.7
January Temp. °F	-29.3	7.4	32.5
July Temp. °F	30.2	55.8	85.5
Absolute Temp. °F	-60		86
Yearly Precip. in	6.3	16.3	22.7
January Precip. in	0.0	1.3	4.6
July Precip. in	0.0	1.7	3.4
Yearly Snowfall, in	46.5	80.4	254.5

Averages

	Jan	Feb	Mar	Apr	May	Jun
T, °C	-13.7	-11.6	-7.7	-1.5	4.9	10.2
P, mm	33.5	31.8	38.6	33.5	33.3	24.4
S, cm	36.1	29.7	37.3	25.1	6.9	0.5

	Jul	Aug	Sep	Oct	Nov	Dec	Ann
T, °C	13.2	12.4	8.7	3.4	-4.6	-11.8	0.28
P, mm	42.2	44.5	34.3	31.2	32.0	34.3	414.27
S, cm	0.0	0.0	0.8	8.4	25.1	34.5	204.22



The Taylor Park weather station is in the bottom of Taylor Park, a broad valley with a dam and reservoir at one end, where cold air drainage is the dominant weather feature most days of the year. It is located in Ecological Type SU3, Mountain big sagebrush/Idaho fescue on glacial surfaces. This is near the lower boundary of the Subalpine Zone, which makes this weather station the only one in the UGB that is near to measuring Subalpine climates.

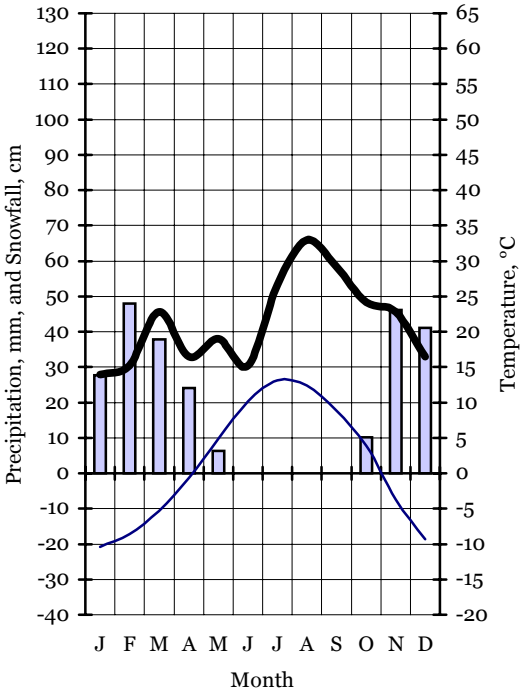
Rio Grande Reservoir	21 yr (1977-1997)	9,500 ft (2,895 m)

Quantity	Min	Avg	Max
Yearly Temp. °F	12.5	34.1	54.5
January Temp. °F	-14.4	13.2	41.5
July Temp. °F	31.3	55.6	77.7
Absolute Temp. °F	-46		89
Yearly Precip. in	4.4	19.5	32.7
January Precip. in	0.0	1.1	32.0
July Precip. in	1.8	2.1	48.9
Yearly Snowfall, in	0.0	95.1	225.5

Averages

	Jan	Feb	Mar	Apr	May	Jun
T, °C	-10.4	-8.6	-5.3	-0.6	4.9	10.1
P, mm	27.9	30.5	45.7	33.0	38.1	30.5
S, cm	27.7	48.0	37.8	24.1	6.4	0.0

	Jul	Aug	Sep	Oct	Nov	Dec	Ann
T, °C	13.1	12.4	8.9	3.9	-3.7	-9.3	1.17
P, mm	53.3	66.0	58.4	48.3	45.7	33.0	495.30
S, cm	0.0	0.0	0.0	10.2	46.2	41.1	241.55



Rio Grande Reservoir is in the valley of the headwaters of the Rio Grande, to the south of the UGB. It is included here to show what Subalpine forested climates are like. There are no drought or near-drought periods, and the snowfall and growing-season precipitation are both significant. This probably shows the influence of the San Juan Mountains, a large massive mountain range. The San Juan Mountains attract storms throughout the year, that makes the Subalpine climate there especially moist, even here, on their east slope – the climate lower down on this slope is considerably drier (see Saguache above).

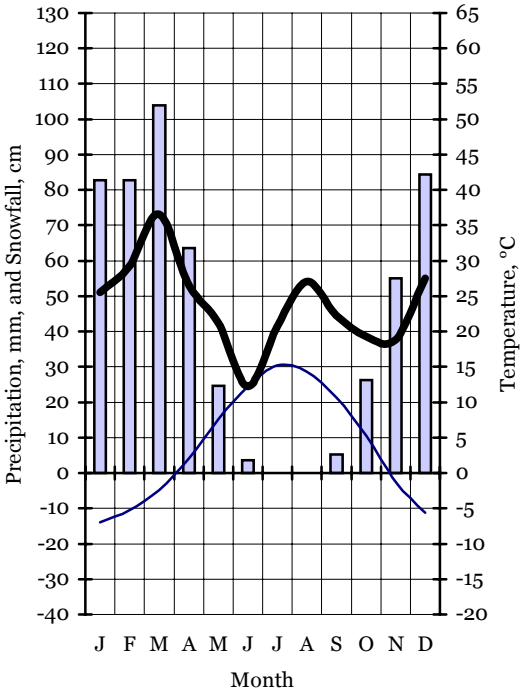
Sapinero 9W	27 yr (1920-1946)	9,300 ft (2,834 m)

Quantity	Min	Avg	Max
Yearly Temp. °F	23.9	39.0	55.3
January Temp. °F	-0.9	19.4	39.5
July Temp. °F	42.0	59.3	77.9
Absolute Temp. °F	-29		88
Yearly Precip. in	14.5	22.5	29.4
January Precip. in	0.5	2.0	5.7
July Precip. in	0.9	1.6	3.7
Yearly Snowfall, in	126.1	209.1	272.6

Averages

	Jan	Feb	Mar	Apr	May	Jun
T, °C	-7.0	-5.2	-2.4	2.1	7.6	12.2
P, mm	51.1	58.4	73.2	53.1	42.4	24.4
S, cm	82.8	82.8	103.9	63.5	24.6	3.6

	Jul	Aug	Sep	Oct	Nov	Dec	Ann
T, °C	15.2	14.3	10.7	5.3	-1.3	-5.6	3.89
P, mm	41.4	54.1	44.5	38.6	37.6	55.1	572.52
S, cm	0.0	0.0	5.3	26.2	55.1	84.3	531.11



I do not know where this weather station was, maintained from the early 1920s through the late 1940s. It had considerable snowfall during that period, but shows the spring near-drought in June that indicates that it was in a partial rainshadow then.

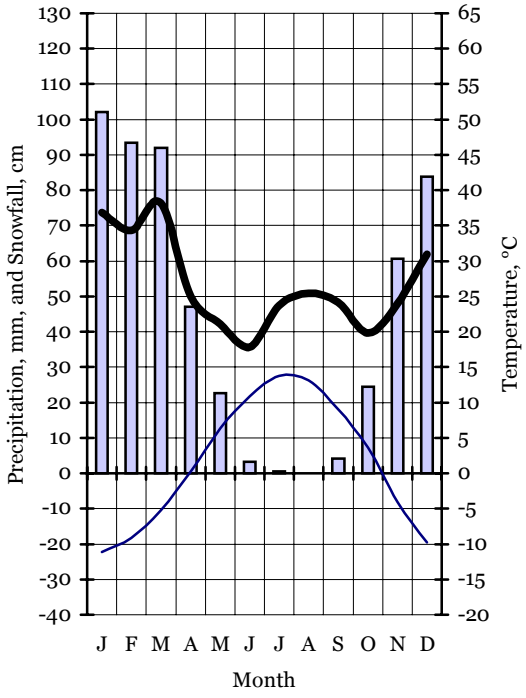
Crested Butte — 104 yr (1894-1997) — 8,870 ft (2,703 m)

Quantity	Min	Avg	Max
Yearly Temp. °F	9.8	34.6	57.4
January Temp. °F	-20.3	12.1	40.6
July Temp. °F	26.2	56.9	81.7
Absolute Temp. °F	-47		95
Yearly Precip. in	5.0	24.5	93.2
January Precip. in	0.0	2.9	14.4
July Precip. in	0.0	1.9	5.5
Yearly Snowfall, in	44.0	187.3	361.7

Averages

	Jan	Feb	Mar	Apr	May	Jun
T, °C	-11.1	-9.1	-5.2	0.3	6.3	10.9
P, mm	73.7	68.6	76.5	50.0	42.2	35.6
S, cm	102.1	93.5	91.9	47.0	22.6	3.3

	Jul	Aug	Sep	Oct	Nov	Dec	Ann
T, °C	13.8	13.1	9.1	3.6	-4.1	-9.8	1.44
P, mm	47.5	50.8	48.3	39.6	48.0	62.0	622.81
S, cm	0.5	0.0	4.1	24.4	60.7	83.8	475.74



The weather station at Crested Butte, one of the oldest in the basin, shows the influence of the Elk Mountains. The Elk Mountains are a large massif that attracts large, moisture-laden storms, especially in the winter. There is no drought or near-drought, and more moisture comes in the winter than in the summer. The weather station is located near three Ecological Types: 1. SU1, Mountain big sagebrush/Thurber fescue; 2. RI2, Serviceberry willow-reedgrass-beaked sedge; and 3. FL01, Subalpine fir-Douglas-fir/pachistima. It is thus near the lower end of the Subalpine Zone.

Marshall Pass — 6 yr (1947-1952) — 10,850 ft (3,307 m)

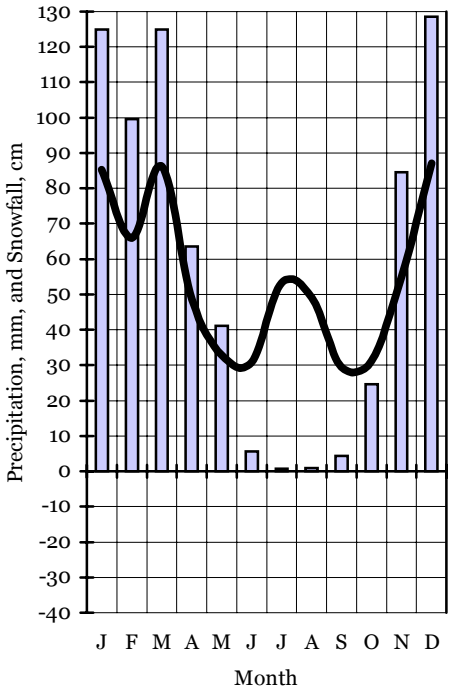
(Precipitation and Snowfall only)

Quantity	Min	Avg	Max
Yearly Precip. in	12.6	25.5	34.0
January Precip. in	0.0	3.4	5.2
July Precip. in	0.0	2.1	4.1
Yearly Snowfall, in	176.6	277.5	400.5

Averages

	Jan	Feb	Mar	Apr	May	Jun
P, mm	85.3	66.0	86.1	48.5	33.0	30.7
S, cm	125.0	99.6	125.0	63.5	41.1	5.6

	Jul	Aug	Sep	Oct	Nov	Dec	Ann
P, mm	53.3	49.0	29.5	31.2	54.9	87.1	646.94
S, cm	0.8	1.0	4.3	24.6	84.6	128.5	704.85



The weather station at Marshall Pass was maintained for only six years in the late 1940s and early 1950s, yet it shows the highest precipitation yet recorded in the UGB. It is also the only weather station in the basin clearly in Subalpine forest. The weather station was located near the boundary between two Ecological Types: 1. FL09, Subalpine fir-Engelmann spruce/Rocky Mountain whortleberry; and 2. RI4, Planeleaf willow/water sedge. Unfortunately, temperature was not recorded.